

WHAT IS CLAIMED IS:

1. A differential pressure measurement probe adapted for placement within a fluid-carrying conduit, the probe comprising:

a first plenum configured to couple to a first pressure sensor port, the first plenum including an impact surface with at least one impact aperture disposed therein to communicate pressure from the impact surface to the first pressure sensor port;

a non-impact surface spaced from the impact surface, the non-impact surface having at least one non-impact aperture disposed therein to communicate pressure from the non-impact surface to a second pressure sensor port; and

wherein the impact surface extends longitudinally and is substantially flat, such that fluid within the conduit impinges upon the substantially flat impact surface.

2. The probe of claim 1, and further comprising a second plenum, and wherein the non-impact surface is disposed on the second plenum.

3. The probe of claim 2, wherein the first and second plenums are spaced by a longitudinal rib configured to extend downstream.

4. The probe of claim 3, wherein the rib is disposed perpendicular to the impact surface.

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5. The probe of claim 2, wherein the second plenum is shaped to include a longitudinally extending rib portion coupled to the first plenum.

6. The probe of claim 5, wherein the at least one non-impact aperture is disposed in the rib portion.

7. The probe of claim 2, wherein the non-impact surface is substantially flat.

8. The probe of claim 7, wherein the non-impact surface is substantially parallel to the impact surface.

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9. The probe of claim 2, wherein the second plenum is shaped to include a pair of longitudinally extending rib portions diverging angularly with respect to the impact surface.

10. The probe of claim 9, wherein the non-impact surface is disposed on a portion of one of the laterally extending rib portions that faces the other of the laterally extending rib portions.

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11. The probe of claim 2, wherein the second plenum is shaped to include a pair of spaced apart longitudinally extending rib portions each disposed perpendicular to the impact surface.

12. The probe of claim 1, wherein the first plenum has a plenum width and the impact surface is shaped to create a localized region of relatively high pressure across substantially the entire plenum width.

13. The probe of claim 12 wherein the plenum width ranges from about 1.27 centimeters to about 5.08 centimeters.

14. The probe of claim 1, wherein the at least one impact aperture has an aperture width ranging from about 0.0762 centimeters to about 0.635 centimeters.

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15. The probe of claim 1, wherein the first plenum has a plenum width, the at least one impact aperture has an aperture width, and wherein the ratio of plenum width to aperture width is greater than about 8:1.

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16. A differential pressure measurement probe adapted for placement within a fluid-carrying conduit, the probe comprising:

means for sensing impact fluid pressure through at least one impact aperture; and

means for sensing non-impact fluid pressure through at least one non-impact aperture.

17. A method of measuring differential pressure in a fluid-carrying conduit comprising:

generating an upstream pressure with a longitudinally extending substantially flat impact surface;

communicating the upstream pressure from an impact aperture disposed on the impact surface to a first pressure sensor port;

generating a non-impact pressure;

communicating the non-impact pressure from a non-impact aperture to a second pressure

sensor port, the non-impact aperture
being spaced from the impact aperture.

18. A differential pressure measurement system coupleable to a process control loop and adapted to communicate a process variable output related to a differential pressure of a fluid flow within a fluid-carrying conduit, the system comprising:

a process pressure transmitter including:

a loop communicator coupleable to the process control loop and adapted for communication upon the process control loop;

at least one pressure sensor having first and second pressure inlets; measurement circuitry coupled to the at least one pressure sensor and configured to provide a sensor output related to differential pressure between the first and second pressure inlets; and

a controller coupled to the measurement circuitry and the loop communicator, the controller adapted to provide a process variable output to the loop communicator, the process variable output related to the sensor output; and

a differential pressure measurement probe adapted for placement within the fluid-carrying conduit, the probe including: a first plenum coupled to the first pressure inlet, the first plenum

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including a longitudinally extending impact surface with at least one impact aperture disposed to communicate pressure from the impact surface to the first pressure inlet;

a non-impact surface spaced from the impact surface, the non-impact surface having a non-impact aperture disposed to communicate pressure from the non-impact surface to the second pressure inlet.

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19. The system of claim 18, wherein the transmitter and probe are matched for a specific application.

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